

PUBLIC HEALTH ACT.

(11 & 12 Vict, Cap. 63.)

REPORT

TO THE

GENERAL BOARD OF HEALTH,

ON A

PRELIMINARY INQUIRY

INTO THE SEWERAGE, DRAINAGE, AND SUPPLY OF
WATER, AND THE SANITARY CONDITION
OF THE INHABITANTS

OF THE TOWN OF

ALTRINCHAM,

IN THE COUNTY OF CHESTER.

BY ROBERT RAWLINSON, Esq.,

SUPERINTENDING INSPECTOR.



LONDON:

PRINTED BY W. CLOWES & SONS, STAMFORD STREET.

FOR HER MAJESTY'S STATIONERY OFFICE.

1850,

NOTIFICATION.

THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 20th of September next, being a period of not less than one month from the date of the publication and deposit hereof, written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Town and Township of ALTRINCHAM, or with respect to any amendment to be proposed therein.

By order of the Board,

HENRY AUSTIN, *Secretary.*

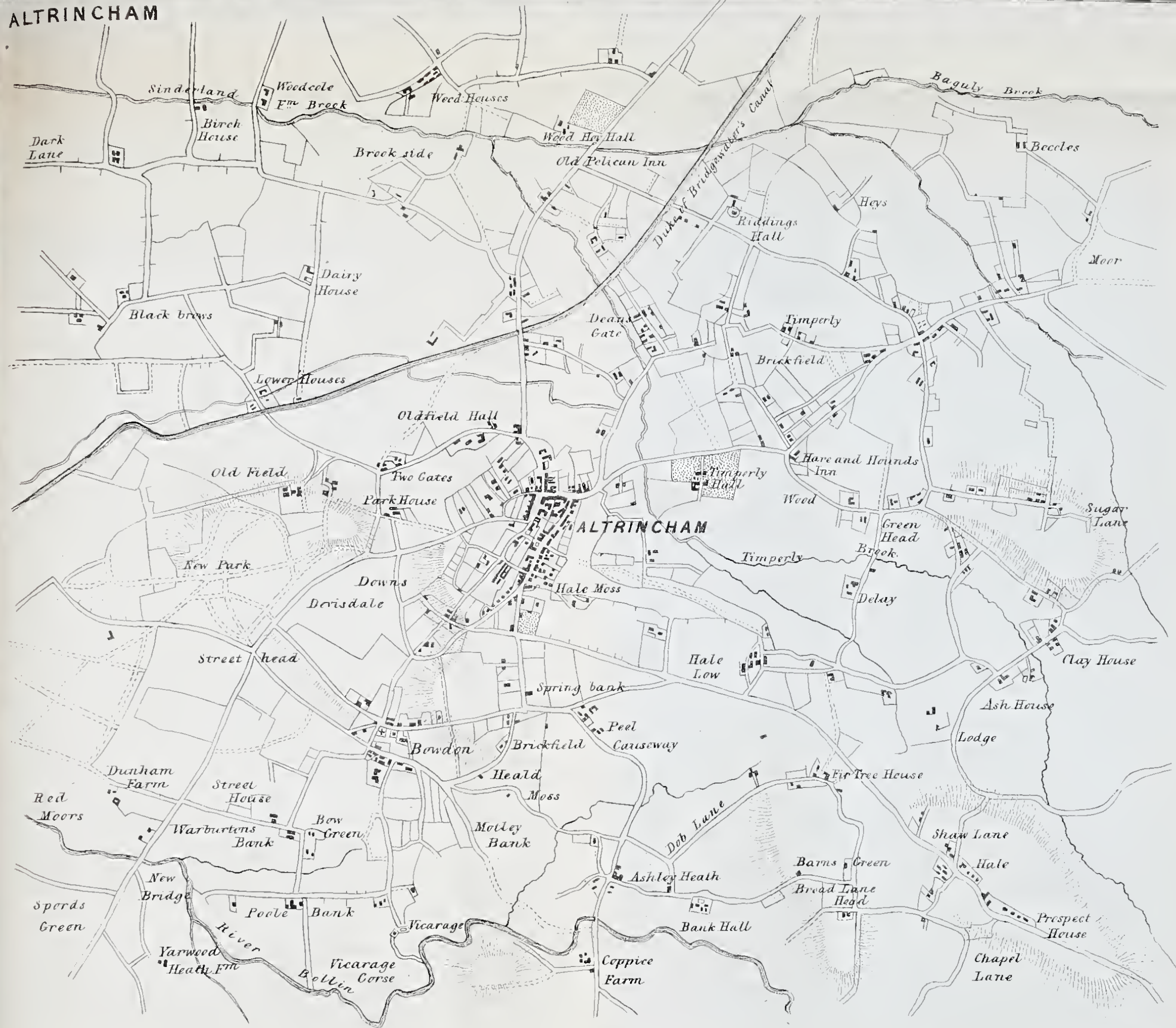
*Gwydyr House, Whitehall,
5th August, 1850.*

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Note to Binder.—Insert General Plan at commencement of Report; Plan of Yards and Houses at page 18.

ALTRINCHAM



Scale
 Furlongs 8 7 6 5 4 3 2 1 0
 1 Mile.



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PUBLIC HEALTH ACT (11 and 12 Vict., Cap. 63).

Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants, of the Town of ALTRINCHAM, in the County of Chester. By ROBERT RAWLINSON, Esq., Civil Engineer, Superintending Inspector.

MY LORDS AND GENTLEMEN,

London, July 1850.

WHEREAS, in pursuance of the Public Health Act, 1848, the General Board of Health, appointed for the purposes of that Act, have, upon the petition of not less than one-tenth of the inhabitants rated to the relief of the poor of and within the town of Altrincham, in the county of Chester (the number of the said petitioners greatly exceeding 30 in the whole), directed Robert Rawlinson, a Superintending Inspector, to visit the said town, and to make public inquiry, and to examine witnesses as to the sewerage, drainage, and supply of water; the state of the burial-grounds; the number and sanitary condition of the inhabitants; and as to any local Acts of Parliament in force within such town and chapelry for paving, lighting, cleansing, watching, regulating, supplying with water, or improving the said town or having relation to the purposes of the said Act; also as to the natural drainage areas, and the existing chapelry, or other local boundaries, and the boundaries which might be most advantageously adopted for the purposes of the said Act:

Now, I, the said Robert Rawlinson, having previously given the notices directed by the said Act, proceeded upon the said inquiry in the manner directed by the said Act, and do now report in writing to your Honourable Board upon the several matters with respect to which I was directed to inquire as aforesaid, and upon certain other matters, in respect of which I deem it expedient to report for the purposes of the said Act:—

NOTICES PROPERLY GIVEN.—Messrs. Nicholls and Worthington, solicitors, proved the proper publication and affixing the printed notices, as the Act directs, and the inquiry took place at 11 o'clock in the forenoon, at the Unicorn Inn, Altrincham, the following named gentlemen being present—J. A. Worthington, Esq., solicitor; Edward Joynson, Esq.; W. M. Millington, Esq.; Richard Broadbent, Esq., surgeon; R. W. Bennett, Esq.; John Woollam, Esq.; Thomas Blease, Esq., surgeon; Charles Robinson, Esq., surgeon; Mr. Thomas Balshaw; Mr. John Partington; Mr. William Warren; Mr. Isaac Turton, assistant-overseer, surveyor of highways, and others.

I received much assistance from the gentlemen named. W. Tatton Egerton, Esq., M.P., has taken a warm interest in the improvement of the town, and there is a general anxiety to obtain the means of carrying out proper sanitary works and regulations.

In opening the court, I explained the object of the inquiry—namely, that it was to obtain such information as might enable your Honourable Board to judge of the propriety, or otherwise, of applying the Public Health Act to the town and township of Altrincham, as requested in the terms of the following petition, which had been forwarded to your Honourable Board:—

• “PUBLIC HEALTH ACT, 1848.

“*Preamble of Petition for Application of the Act.*

“Whereas by the Public Health Act, 1848, it is enacted, That from time to time after the passing of that Act, upon the petition of not less than one-tenth of the inhabitants rated to the relief of the poor, of any city, town, borough, parish, or place having a known or defined boundary, not being less than 30 in the whole, the General Board of Health may, if and when they shall think fit, direct a superintending inspector to visit such city, town, borough, parish, or place, and to make public inquiry, and to examine witnesses as to the sewerage, drainage, and supply of water; the state of the burial-grounds: the number and sanitary condition of the inhabitants; and as to any local Acts of Parliament in force within such city, town, borough, parish, or place for paving, lighting, cleansing, watching, regulating, supplying with water, or improving the same, or having relation to the purposes of this Act; also as to the natural drainage areas, and the existing municipal, parochial, or other local boundaries, and the boundaries which may be most advantageously adopted for the purposes of this Act; and as to any other matters in respect whereof the said Board may desire to be informed, for the purpose of enabling them to judge of the propriety of reporting to Her Majesty, or making a provisional order, as mentioned in the said Act.

“Now therefore, we the undersigned inhabitants of the township of Altrincham in the parish of Bowdon, in the county of Chester, and rated to the relief of the poor of and within that township, and being one-tenth in number of the inhabitants rated to the relief of the poor of and within the same township, do hereby petition the General Board of Health to direct a superintending inspector to visit the said township, and to make inquiry and examination with respect thereto, with a view to the application of the said Act, according to the provisions of the said Act in that behalf.

(Signed) “FRANCIS ORTON, Altrincham.
E. J. LLOYD, Oldfield, Hull.”
And 153 others.

DESCRIPTION OF TOWN, &c.—Altringham or Altrincham, a small town in the parish of Bowdon, and county of Chester, is about eight miles south-west of Manchester, and nearly 180 north-west from London. The number of people in Altrincham,

in 1750, was about 1,000; in 1772 the census was accurately taken, when there appeared to be 248 families, and 1,029 inhabitants. In 1831 there were 2,708 inhabitants, and in 1841, 3,399, but the town has been considerably increased of late. The following table will show the relative proportion the township bears to the parish of Bowdon.

The entire parish of Bowdon contains 18,660 acres, and at the census of 1841 had a population of 9,473 inhabitants. It includes the following nine townships and two chapelries:—

CENSUS of 1841.

TOWNSHIP OR CHAPELRY.	English Statute Acres.	HOUSES			PERSONS.		
		In-habited.	Unin-habited	Build-ing.	Males.	Females.	Total.
Agden (part) Township . . .	670	4	1	..	25	20	45
Altrincham Chapelry . . .	520	664	20	..	1,539	1,860	3,399
Ashley Township . . .	2,390	63	2	..	208	169	377
Baguley Township . . .	2,070	96	1	2	267	238	505
Bollington (part) Township	400	50	2	..	136	168	304
Bowdon Township . . .	690	106	..	9	359	290	649
Carrington Chapelry . . .	2,070	95	2	..	277	282	559
Dunham Massey Township	3,710	219	4	..	644	613	1,257
Hale Township . . .	3,540	181	2	..	504	470	974
Partington Township . . .	1,220	83	5	..	243	214	457
Timperley Township . . .	1,380	185	1	2	476	471	947
Total . . .	18,660	1,746	40	13	4,678	4,795	9,473

In 1841 the number of inhabited houses in Altrincham was 616, in May 1849, 781, being an increase of 165 in eight years. At the time of this inquiry, 37 additional were in course of erection. The increase in the population since 1841 is considered to be 1,473; 165 new houses—average number of inmates in each $5\frac{1}{2}$ —907. It is also estimated that there has been an increased population of one-sixth added to the old houses, amounting to 566, making a total population up to the time of this inquiry of 4,872. The railway has been in active operation since this time. Many new houses have been erected, and from the facilities now afforded, a rapid increase may be anticipated.

EARLY HISTORY.—This town is of the ancient fee of the barons of Dunham Massy, one of whom, Hamon de Massy (temp. Edw. I.) instituted burgesses, and granted them a *guild mercatory* about the year 1290. In this deed the names are thus written: Altrincham, Bowdon, Doneham, Tymperlegh, Baggelegh, and Sunderland. The same Hamon, by charter (18th Edward I.) granted a Tuesday market and a three days' fair on the 15th of August; the market is still held on Tuesday, but the fairs are now kept on the 29th April, the 5th and 6th August, and on the 22nd November. Sir Peter Leycester, in his "Historical Antiquities," says, "There are so very many small cottages erected

here by permission of the Lords of Dunham Massy, that it is now become a nest of beggars." Dr. Ormerod states that the manor of Altrincham descended with Dunham Massy to the Earls of Stamford, and though within the jurisdiction of the barony leet, a distinct court leet is held by the Earl, in and for the borough of Altrincham. The borough is governed by constables, and though a "Mayor" is annually appointed, he has no magisterial jurisdiction, and his duties are chiefly opening the fairs and expending a yearly sum, which, it is said, is left at his discretion. It is usually devoted to dimers for the burgesses.

The following is a translation of the charter granted in the reign of Edward I. :—

"**CHARTER OF HAMON DE MASSY.**—To all the Faithful of Christ, who may inspect or hear this present charter, Hamon de Massy, Lord of Doneham, everlasting greeting in the Lord. Know ye that I have given, and by this my present charter, for me and my heirs, have confirmed to my burgesses of Altrincham, that my vill of Altrincham be a free borough; and that my burgesses of the said borough may have a guild mercatory in the same borough, with all the privileges and free customs appertaining to such guild, according to the customs of the borough of Macclesfield. And that they, throughout all my estate, as well by water as by land, be quit of fair and market toll, passage, pontage, stallage, lastage, and all other servile customs. I have also granted to my aforesaid burgesses common of pasture and heath-turbary, within the boundaries of Doneham, Altringham, and Tymperlegh, saving to me and my heirs our improvements, and saving to me and my heirs the right of enclosure of Sunderland,* at our pleasure, without contradiction of any, whensoever we will to enclose it. So that my aforesaid burgesses may, always and everywhere, have common of pasture for all their animals, within the bounds of Sunderland, provided that the aforesaid place of Sunderland should not be enclosed; saving to me and my heirs all the time of pannage in the aforesaid Sunderland, so that during that time we may be able, at our pleasure, to have the aforesaid Sunderland in defence, without contradiction of any. And when the aforesaid Sunderland shall be enclosed, my aforesaid burgesses may have their common as far as the hay of the aforesaid Sunderland, and not beyond. I also will that all my burgesses, who may have swine in the time of pannage, in my borough, or after the feast of the blessed James, and in the time of pannage, that they may give the right tac when they pasture within the aforesaid commons; and elsewhere with their pigs of the said borough, in the time of pannage they shall not go. I have also granted to my aforesaid burgesses household and haybold in all the woods of the aforesaid places, except the hedges and fences of my woods. I grant also to my aforesaid burgesses, that they shall not be impleaded without a port-mote of the same borough; nor shall they be drawn into any court beyond their borough, for transgressions committed within the borough. And if any of them shall fall into mercy for any forfeit, he shall be amerced by his peers, and that according to the extent of his offence. I will also that

* Sunderland, now Sinderland.

my burgesses shall grind all their grain grown upon the land of Altrincham, or sold at an inn in the same town, at my mill, for the eighteenth vessel as multure. I grant also that my aforesaid burgesses may make to themselves boroughreeves and bailiffs, by the common council of myself, or of my bailiffs and theirs. And no plea shall be held or determined in the said borough, save before me or my bailiff. And that every burgess may hold his single burgage of two perches of land in width and five in length, with one entire acre of land in the fields, for twelve pence, at three terms of the year, to me and my heirs, payable annually, by equal portions, viz., at the Nativity of St. John the Baptist, at the Feast of All Saints, and at the Annunciation of the blessed Virgin, freely, quietly, peaceably, and honestly, with all the aforesaid written privileges. And that each burgess shall be able to sell, pledge, or give his burgage, or to bequeath it by will, to any person or persons he chooses, excepting to the servants of our lord the king and to religious men, without hindrance from any person or persons; saving to me and my heirs the right of our oven in the same borough. I, therefore, the aforesaid Hamon and my heirs, will warrant the aforesaid burgages, with the acres of land adjoining thereto, and all the above-written liberties, to my aforesaid burgesses, and their heirs and assigns, against all men in perpetuity. In testimony of which I have affixed my seal to this present charter. These being witnesses, Sir Reginald de Grey, then Justiciar of Chester; Humphrey de Beauchamp, Richard de Massy, Knights; Gilbert de Aston, Thomas de Acton, Hugh de Baggelegh, Matthew de Hale, Henry de Doneham, John de Bowdon, and others."

Some remarks, observations, and suggestions, will be found in an Appendix relative to the land conveyed to the burgesses by this charter.

There exists no local power to pave or cleanse the town, except under the general Highway Act; and no power whatever with regard to the new streets, as the Highway Act extends over one portion of the town only.

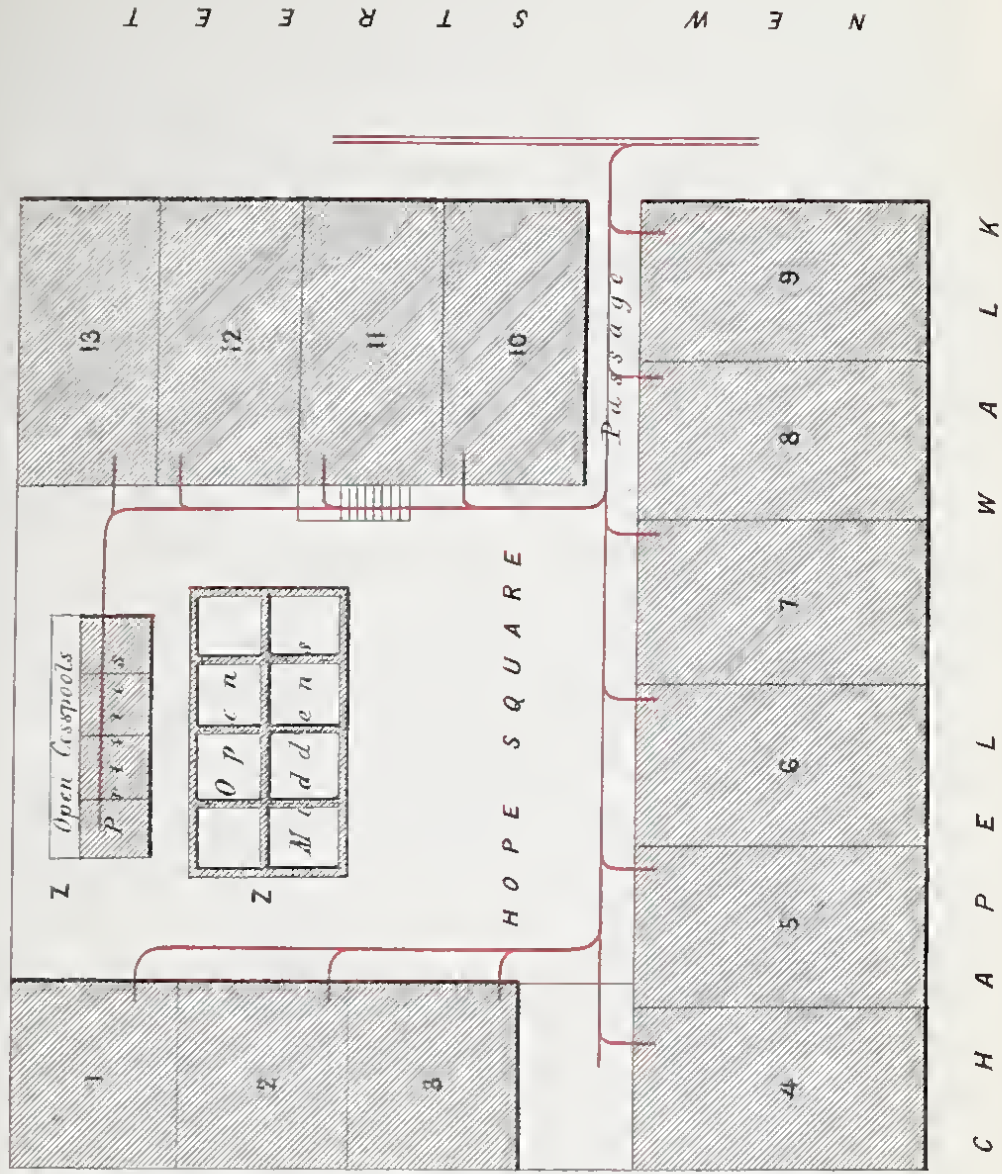
No local Act is in force, but the general Act for Watching and Lighting was adopted in 1832. This Act is confined to a portion of the chapelry of Altrincham, comprised in the boundaries hereinafter mentioned, viz. :—

“ Commencing in the road to Stockport, at the south-easterly corner of Mr. Bagshaw's garden, and along the fence on the easterly side and northerly end thereof, to Mr. William Pass's gate, round Mr. William Pass's orchard, to Miss Bridget Boardman's garden, thence along the easterly side of the bowling-green and Mr. Cave's premises, and Mrs. Moverley's garden, thence along her fence and the fence of Mrs. Warburton's garden, to Mrs. Ann Hardey's, and along the easterly end and northerly side of her garden to the turnpike road, across the road, and passing on the northerly side of Mr. Robertson's premises, to and along Oldfield-lane, to the extreme end of the garden wall of Oldfield-hall, thence up the fence of Mrs. Rigby's pleasure grounds, and along the fence of Mr. Broadbent's field, and the north-westerly end of Mr. Hayworth's garden, Mr. Worthington's field, round Mr. Poole's property, to the Knutsford turnpike-road in Dunham-lane, thence along the same

road to the corner of Mr. Harrop's Hothouse-field, and along the westerly and southerly sides thereof, across the Back-lane to the north-westerly corner of William Davenport's garden, thence along the south-easterly fence of Mr. Harrop's field to the south-westerly corner of Miss Cliff's premises, thence to the top of Norman's-place, thence up the foot-road to Mr. Crallan's stable, thence including Mr. Crallan's garden and pleasure grounds, to the Cross-lane leading to the Burying-lane, thence eastwardly along the same Cross-lane in front of Mr. Crallan's property, and along Bowdon-downs to the front of Mr. Raingill's premises, thence across the road to and along the back of Mr. Harrop's cottages (formerly dog-kennels) to the Mayor's-field, and along the northerly fence thereof to the high-road leading to Ashley, thence crossing the road at Mrs. Baldwin's house, and proceeding down the fence of her garden to and along the back of Mr. William Royle's garden, to John Pickstone's garden, and from thence along the back of and round John Rowbottom's premises to the Pinfold, thence from the corner of Samuel Royle's garden, along the south-easterly fence thereof, in a line to and including William Holt's garden at the bottom of Ham-lane, thence from William Holt's corner along the southerly fence to the trench at Skin Pits, thence along the back of John Moss's premises up the northerly fence to Charles Balshaw's, joiner, from thence along the easterly and round the northerly side of Mr. Worthington's gardens to Mr. George Gratrix's fence, from thence along the same to the easterly corner of Mr. James Mitchell's garden, and thence up to the Stockport turnpike-road."

PRESENT CONDITION OF TOWN.—Altrincham at present consists of the market-place, Church-street, High-street, Victoria-street, Stamford-street, Police-street, Well-street, George-street, Post-office-place, and some other streets, lanes, courts, and places, with a few suburban houses and villas. Some of the old parts are overcrowded, but in general the town is open. Several new streets have recently been laid out, and detached residences have been erected in the district. Latterly great facilities have been afforded in ready and cheap means of conveyance betwixt the town and Manchester, by means of omnibus, as also by means of swift boats upon the Bridgewater Canal, and more recently by the Altrincham branch of the South Junction and Manchester Railway. It is therefore of the utmost importance that the inhabitants should possess a proper form of local government,—that the direction and width of all new streets, courts, alleys, passages, &c., may be regulated,—that proper sewers and drains may be constructed,—that all streets, courts, alleys, lanes, and passages liable to be used by the public may at once be paved and regulated,—that public lighting may be accomplished to the fullest extent,—that a sufficient supply of pure water may be obtained,—and that all necessary regulations may be carried out for the good of the whole community, and the pecuniary benefit of the ratepayers generally. Under active and judicious local government, the town no doubt will be rapidly increased, as,

M^r Hope's Premises



Earl of Stamford's Premises



N.B. The pink lines indicate the direction in which the tile pipe drains may be laid. Each House may have a properly trapped communication. Privies may be abolished and Water Closets substituted.



NOTE. The open middens at Z, Z, are generally very foul, and at times raining over with manure. They are opposite the doors & windows of the adjoining houses.

Scale



naturally and artificially, the district possesses many and singular advantages.

GEOLOGY.—The town stands upon the new red sandstone, or saliferous formation, the stratification in the immediate neighbourhood consisting of sand, gravel, clay, marl, and peat. There is every natural facility, in contour and subsoil, for completing proper works of drainage.

METEOROLOGY.—The general character of the atmosphere is moist, but by works of drainage the subsoil may be rendered dry, which will greatly improve the land, as also the climate. The annual rainfall varies considerably, ranging from 26 to 48 inches, but the average may be taken from 30 to 40 inches. The prevailing winds are from the west, and points intermediate betwixt this and south; and as the site of Altrincham is to the south of the Manchester manufacturing district, the atmosphere is seldom affected by the smoke. The Bridgewater canal passes near the town, and the tainted condition of its water was complained of at the inquiry, as being, at times, “a very great nuisance.”

CONDITION OF AGRICULTURAL LAND IN THE SUBURBS.—Scientific land-draining, on an extensive scale, has not yet been carried out; and any drainage of the town which has been done, is most imperfect. Considerable areas of land are, however, cultivated as market-gardens to supply the inhabitants with vegetables, but more especially the town of Manchester. Deep drainage will increase the value of the land for agricultural purposes, as also add to the general warmth and salubrity of the atmosphere.

MORTALITY.—The following is a return of the number of deaths in Altrincham for six years, ending March 1849:—

From 31st March, 1843 to 31st March, 1844	. . .	78
”	” 1844	” 1845 . . . 76
”	” 1845	” 1846 . . . 105
”	” 1846	” 1847 . . . 135
”	” 1847	” 1848 . . . 122
”	” 1848	” 1849 . . . 88
		6)604

Average annual deaths . . . 100·4

Or about 29·54 deaths per 1,000.

(Signed)

JNO. B. CUTLER.

A mortality of $29\frac{1}{2}$ * per thousand for such a town as Altrincham is very high. It may be said, however, that taking the census of 1841 to average the deaths from 1843 to 1849, gives a return in excess. But if the extreme population is presumed to be 5,000,

* It is not possible to arrive at accurate results in the calculations made; many circumstances occur to prevent a full knowledge of the true proportions of preventible deaths. The figures given, indicate, however, that great pecuniary loss to the community does take place.

and this is taken for the whole period, the rate of mortality is shown to be 25·1 per thousand, which is very much in excess over that which is known to prevail in well regulated districts, namely, 15 per thousand. 25·1 per thousand, taken as the basis for the following calculation, will show the rate-payers the presumed annual loss to the community from what has been aptly termed "preventible disease." If the average population is taken at 5,000, and the number of deaths annually in excess 10 in each thousand, there must have been 50 deaths annually, which it is reasonable to hope proper sanitary works would have prolonged. Medical men have calculated that for each case of preventible death there are, on an average, 30 cases of preventible sickness; so that 1,500 cases of preventible sickness must have taken place per annum during the last six years. The annual money loss may be represented thus:—50 deaths annually, say one-fourth adults, which will be, say 12, and that five years of each life has been cut off at an average annual value of 30*l.*, 150*l.* will thus represent the value of each adult life. Each funeral may be valued at 5*l.*, and each case of sickness at 1*l.*, the sum total will stand as under:—

	£.	s.	d.
50 funerals each at 5 <i>l.</i>	250	0	0
12 adult lives as above, 150 <i>l.</i>	1,800	0	0
1,500 cases of sickness, each 1 <i>l.</i>	1,500	0	0
Annual money loss	£ 3,550	0	0

It is no doubt difficult for persons not accustomed to view the question in this light to reconcile any such loss to their mind, but they must remember that health is capital to the working man, and if defective sanitary arrangements produce disease so as to prevent the labour of one week in each year, the loss of that week's earnings is fairly chargeable to this cause.

PRESENT DRAINAGE OF THE TOWN.—There is no general system of drainage in the town. There are several surface and road drains, two of which empty themselves into the watercourse flowing from Hale Moss, one into Timperley Brook, and one at Sandiway; the latter is in the turnpike road, and belongs to the trustees of that road. The following is a list of the existing sewers:—

Length in yards.

748 Sewer from Dunham-road, Church-street, circular of brick, and 15 inches internal diameter.

528 Sewer from George-street to Police-street, pipe-tile 9 inches diameter.

231 Sewer from the Downs, tile 9 inches in diameter.

286 „ in Victoria-street „ „

176 „ in Stamford-street „ „

176 „ in Shaw's-lane „ „

352 „ in Goose-green „ „

286 „ along railway, brick, 3 feet by 2 feet.

The cottage property generally has no form of underground drainage.

HIGHWAYS AND STREETS.—One mile 115 yards of the highways within the township are paved with boulders; $4\frac{1}{2}$ miles and 44 yards in length are formed and repaired with broken stone and gravel; half-a-mile and 89 yards are unpaved, having a sandy surface. Total length 6 miles and 248 yards; of this 3,505 lineal yards, or $1\frac{1}{4}$ miles and 425 yards, is turnpike road.

NEW STREETS NOT PUBLIC HIGHWAYS.—New-street, 407 lineal yards, containing 104 houses, is neither paved, sewered, or drained; Chapel-street, 203 lineal yards, with 81 houses is not paved or drained. Many of these houses are let as common lodging-houses, and the cellars of several are used as distinct dwellings. Norman's-place, 150 yards in length, with 16 houses, is not sufficiently drained. Sandiway-place, 170 yards in length, with 15 houses, having one small drain. New Town is without any regular form of road, sewer, or drain.

COURTS AND ALLEYS.—There are 10 courts and alleys, containing 67 houses and a resident population of about 368 persons. These houses are, for the most part, used as common lodging-houses, and at times the crowding is extreme.

COMMON LODGING HOUSES.—There were at the time of the inquiry 26 recognised common lodging-houses, having from 4 to 10 beds in each. The number of nightly lodgers, vagrants, and others, was estimated at 546; but the overcrowding frequently exceeds this. All these houses are without proper means of ventilation, drainage, or other sanitary convenience. They are in a dirty and unhealthy state, many of them extremely so.

SLAUGHTER-HOUSES.—There are two slaughter-houses, one near the market-place, used by two butchers, and one at Pinfold Brow, used by four butchers. These slaughter-houses are without drainage or a water supply; the refuse is placed upon or near the premises, and both are frequently most offensive. Upon an average, there are slaughtered weekly, 9 cows, 9 calves, 30 sheep, 12 lambs, and 4 pigs. The proportions varying with the seasons, the weekly slaughter is, about 64, or 3,328 per annum.

BURIAL GROUNDS.—The present burial grounds are, the yard at St. George's Church and the yard at Shaw's-lane Chapel, neither of which, it was stated, can be considered as overcrowded.

WATER SUPPLY.—There is no general form of water supply, but the inhabitants obtain water from public and private wells and pumps. There are two public pumps and one public well. A pump has recently been put down by private subscription for the use of a few, but it is also generally used by the public. It will be seen from the following analysis that all the well waters are hard, and consequently most wasteful. A proper supply of soft and pure water is of the first importance to preserve health and ensure economy.

ANALYSIS OF WATER.

Note on Four Specimens of Water from Altrincham, by Thomas Clark, Professor of Chemistry, in the University of Aberdeen.

“ Three of those specimens are from wells. One of them is from Rosthern Mere. All the well waters are too hard for use, that is to say they would be unfavourable for cooking, and wasteful and otherwise disadvantageous for the purposes of infusing tea or of washing with soap. The New-street pump is the most objectionable in these respects, and has the greatest power of curdling soap. In this latter quality the High-street pump stands next. The Well-street pump curdles soap the least of the three ; but even this water is far too hard to be fit for general use in any town where softer water is within reach. The well waters seem to owe their hardness chiefly to neutral salts of lime and magnesia. The magnesian salts are most abundant in the High-street and the New-street pumps, and are the cause of the curdling quality upon soap observed in those waters. There were traces of organic matter in the Well-street and the High-street pumps, and some, though less, in the New-street pump. The Rosthern Mere water is much softer than the well waters. As this water appears to contain about $7\frac{1}{2}$ grains of chalk per gallon, it would probably deposit some fur, and be softened by boiling. I had too little of this water to try the effect of boiling. This water unboiled stands at $9\frac{1}{2}^{\circ}$ hardness, whereas I conceive it is not desirable to make use of any water above 6° . These observations suggest the inquiry, whether a more diligent search might not discover some other water within reach fitter for the use of the inhabitants of Altrincham. If softer water cannot be found, a trial should be made whether the Rosthern Mere water could not be softened a few degrees by means of lime. There was some vegetable matter in the specimen of this water :—

HARDNESS.

	Actual.	Latent.	Total.	Alkalinity.
Well-street . . .	14°	$+ 2^{\circ}$	$= 16^{\circ}$	$- 0$
High-street . . .	13	$+ 11$	$= 24$	$- ?$
New-street . . .	$15\frac{1}{2}$	$+ 14$	$= 29\frac{1}{2}$	$- 0$
Rosthern Mere . .	$9\frac{1}{2}$	$+ 0$	$= 9\frac{1}{2}$	$- 7\frac{1}{2}$

“ Each degree of hardness stands for as much hardness as a grain of chalk per gallon would produce. Each degree of alkalinity, for as much alkalinity (that is as much power of neutralizing sulphuric or other acid) as a grain of chalk per gallon would possess. The actual hardness is due to lime salts. The ‘ latent ’ hardness to magnesian salts, which in the presence of so much lime have not the power of acting upon soap unless farther diluted with pure water. But, although these magnesian salts, by their presence do not cause an increased consumption of soap, they cause the soap that is consumed to be much more curdled.

(Signed)

“ THOMAS CLARK.

“ *Mareschal College, 13th March 1850.*”

PUBLIC LIGHTING.—The following particulars relative to the gas-works was furnished by the Company. The town is lighted by the Altrincham Gas Company, registered according to Act of

Parliament, 4th March 1846. The capital 4,000*l.*, in 800 shares of 5*l.* each.

The whole of this sum has been expended, and the Directors have borrowed, agreeably to the powers given them by the deed of settlement to increase their capital, the sum of 300*l.*

There was existing previously a private gas establishment, which the Company purchased immediately upon their formation. But it was inadequate to supply the town; and as it was situated near to the market-place it was considered to be very objectionable, indeed a nuisance.

Several plots of land might have been procured much nearer to the town than the present one; but as the Directors were anxious that no possible nuisance should arise from the works, they decided upon the present site, which is about 840 yards from the nearest part of the town, or near half-a-mile.

The new works were opened on the 29th May 1847. The price of gas from the commencement up to the 24th of June last, was 10*s.* per 1000 cubic feet, when it was reduced to 8*s.* 4*d.*

There are 60 public lamps, lighted from 29th September to 25th March, less three or four nights at full moon. This has not been strictly attended to; another month might in fairness be added, though this is the understanding with the Company.

The Company receive 36*s.* per lamp, but they merely supply the gas. Applications have been made for a few more lamps, and 10 or 12 more would, it is thought, light the present boundary very well.

The works—one gas-holder of 40 feet diameter, capable of containing 22,500 feet of gas; four retorts, capable of making daily 20,000 feet.

Length of mains 3 miles 112 yards, all included in the boundary except 840 yards, the distance of the works beyond the boundary. The quality of the gas is considered to be excellent; it is made from Cannel coal, procured from Ince Hall Coal and Cannel Company.

The Public Act for lighting and watching of towns has been adopted here; and as some parts of the township are agricultural, a boundary excluding those parts has been formed.

There is ample room for extending the works for the supply of a much greater consumption of gas.

REMARKS.—The price, 8*s.* 4*d.*, is much above the average charge for gas, and this no doubt acts as a preventive to a full use. If the local Board can treat for the works, they may be managed, as in Manchester, for the benefit of the rate-payers generally, and the price may be much reduced.

PUBLIC INQUIRY.

ABSTRACT OF EVIDENCE AND REMARKS UPON IT.—Mr. Broadbent and Mr. Robinson, surgeons, gave evidence as to the sanitary state of the town, the substance of which was as follows:—In the opinion of the resident medical practitioners the condition of the town might be much improved by a systematic and effective public and private drainage; by an authorized removal of dunghills, cesspools, and other nuisances from the vicinity of dwelling-houses. Typhus fever prevails more or less in the town every year, and not unfrequently with great severity, as also dysentery and other complaints of the bowels. These diseases they find to originate almost always in the low lodging-houses, and in the dirty, unpaved, undrained, and ill-ventilated squares and alleys inhabited by the working classes, from which typhus fever, often of a very malignant character, spreads to the better streets and affects the shopkeepers and others, occasioning great alarm amongst all classes of the inhabitants. The town of Altrincham, in the opinion of the medical practitioners, situated as it is upon the slope of a hill, composed of red sand and gravel, of great depth, and having no manufactures carried on within the town, ought to be a singularly healthful place; but they consider the reverse of this to be the fact as regards the lower classes, arising from the neglected state and condition of the town, and the want of proper sewage, pavement, and cleansing.

The plans furnished in this Report will show the faulty arrangement of the cottages, yards, middens, and privies. Hope-square, New-street, is an enclosed yard, unpaved and undrained. The privies and cesspools behind stand as shown. The open middens are pits, several yards in depth, bricked round and divided into compartments. The refuse of a year or more is thrown into these places. They were full at the time of my inspection. The yard was in a very filthy condition. The plan of cottages in Victoria-street shows the position of two cottages, manure heaps, pigsties, midden, privy, and pump. The surface is filthy; the subsoil is very porous.

Mr. Woollam stated, “that, as a proof of the general feeling with regard to the inquiry and the introduction of the Act, he might mention, that on his way to the meeting he was met by several working men, who earnestly requested him to call particular attention to the state of the houses in Chapel-square.”

The testimony to the great want of water was unanimous. It was stated, “that in one district of the town there is only one pump for about 150 houses.” The evidence as to the want of sewers and means of house drainage is full and forcible. Mr. Charles Balshaw said,—

“I have lately built 10 houses in Chapel-street, but in consequence of the want of drains, I have been unable to let them.”

The condition of Beggar’s-square was complained of: as the name denotes, it is the residence of beggars, vagrants, and tramps—persons having no direct means of subsistence, but who as truly are maintained by the public as if a regular allowance was paid to them daily from some recognized fund. The following is an instance of the extent to which the Irish will generate nuisances around themselves. It was stated, that “the tenant of one cottage absolutely closed the window-shutter of the ground-floor room, thus depriving it of light and ventilation, that he might pile a dunghill higher up his cottage wall: the result was, that the liquid manure exuded from this dunghill, found its way through the crevices of the shutter and window, and flowed into the house.” It was stated that the Irish would resist to the uttermost any attempt to remove their pigs and dunghills, and it was feared that forcible means of removing these nuisances externally would be followed by the Irish admitting the pigs as inmates of their dwellings, which would be a plunge deeper into filth, malaria, and disease. It had been found necessary for the parish authorities to erect a temporary hospital some time previously for the excess of fever patients.

The cottages are generally confined at the back, and many of the tenants keep pigs on the premises, and as there is no system of drainage, and most imperfect pavement, the surface around and near the houses is foul and offensive to sight and smell. There is seldom any form of pavement at the backs of the cottages, or in the courts and yards, so that the surface wears uneven, which retains much of the rainfall and refuse slops until this is evaporated or worked up into mud, much of which filth is necessarily trodden into the cottages.

There is great want of arrangement with regard to building generally, and more particularly in reference to cottages. This operates most prejudicially against the interest of the owners as well as of the tenants; as this first neglect renders it much more difficult to devise and carry out economical works of improvement than would be the case if the houses in the first instance had been laid out to a regular plan.

There is great necessity for public urinals; those now existing being most objectionably placed. Most of the privies stand near to the house doors, and are so placed as to be a positive nuisance rather than a convenience. Their situation precludes the possibility of their being what the name implies—*privy*.

Many of the cottages inhabited by the working classes are clean internally, and a strong desire was manifested by the majority of this class to possess the means of effectually cleansing their dwellings, not only internally but externally also.

The state of the *Bridgewater Canal* was complained of; Mr.

Woollam stated, "that there was but one opinion about it, namely, that it was a monster nuisance." Mr. Turton stated: "The stench arising from the canal is very bad indeed." In 1758 and 1759, when Acts were passed enabling the great Duke of Bridgewater to construct a canal, the water of the river Medlock, the principal feeder at the Manchester end, was comparatively pure, as indeed were the waters of the several rivers and brooks of the district—the Irwell, the Irk, the Medlock, and the Cornbrook. Parties are living who have fished in the Irwell; but now, all these river-courses pass, not water, but liquid refuse, fetid and loathsome to sight, the exhalations from which are most dangerous to health. Each year, with the growth of the swarming populations in and around Manchester, the extension of drainage in its present most objectionable form adds to the nuisance and the danger. Natural water-courses cannot, with impunity to the unfortunate residents near, be converted into huge cess-pools or sewers. But this will be more fully treated of in another portion of this report under the head of "proposed works."

At the time the Bridgewater Canal was formed, the water was, as previously stated, "comparatively pure"—it was also more than sufficient for the traffic—the use at the Runcorn Locks did not equal the available supply at the Medlock; and this, no doubt, induced James Brindley, who was originally a millwright, to erect water-wheels at the several wharves and stations, to be driven by water drawn from the canal, the number of which wheels have been most injudiciously added to since his time. These machines have been one means of causing the canal to be a much greater nuisance than it otherwise need have been, as the whole of the tainted water of the Medlock has had to be taken in at Manchester to supply the waste caused by working the water-wheels. The remedy must consist in an entire abandonment of the tainted sewer-waters of Manchester, and the obtaining a supply of fresh water, either from the Rochdale Canal, the river Mersey, near Stretford, or some other unobjectionable source. The following letter from Mr. F. Smith will show that the Trustees of the late Duke of Bridgewater have the subject under their consideration:—

"Manchester, August 13, 1849.

"DEAR SIR,

"I MUST apologize for not sooner answering your note of the 9th, and for answering it as I now do, rather hastily. I have been, and am, very much engaged.

"The Trustees are now erecting several steam-engines to supersede the warehouse water-wheels at Runcorn, Preston Brook, and elsewhere, in the hope and belief that, by so doing, they will be able to dispense entirely with the Medlock; and you may remember that the Old Knot Mill warehouse water-wheel is turned by the Medlock water, conveyed to it *direct*, without going into the canal; this was effected a very few years ago.

“When the engines are at proper work, I hope the Canal will be entirely free from the Medlock impurities, except in cases of high floods, which are not frequent, and when they happen, the impurities are much *diluted* with the flood-water.

“*Robt. Rawlinson, Esq.*”

(Signed.) “F. SMITH.

GENERAL OBSERVATIONS AND SUGGESTIONS.—As it is the wish of your Honourable Board that the superintending inspectors should, as engineers, examine each district with a view to works of improvement, and, so far as practicable, embody in their reports practical suggestions, I beg to offer the following general observations and suggestions for the consideration of the local Board in Altrincham, should your Honourable Board see fit to grant the application of the Act.

The town of Altrincham is rapidly increasing; and, therefore, it is of the utmost importance to the present and future inhabitants that a local governing body should be formed; and it is no less important that any new works should, in their character, be comprehensive. The geological site of the district is peculiarly favourable, if full advantage is taken of the means modern science has now placed at the command of men for land drainage, for town and house drainage, and for a full, pure, and economic water supply. In these several works the beneficial use is more than equivalent to the cost, if they are properly devised, economically constructed, and efficiently managed. Ignorance or hasty carelessness may, however, plan works which cannot accomplish the purpose intended; extravagant construction may cause works of utility to be oppressive; and inefficient management may aggravate the nuisance intended to be removed. It should never be lost sight of that works may be laid out in various erroneous forms, but there is rarely more than one right way. There may be many degrees of extravagance in construction, but there can only be one minimum cost; and it will require a complete knowledge of the subject at the outset, and continuous care in superintendence to secure this. Efficiency in action will also depend as much upon the person to whose care the works are committed as to the character of the works constructed.

REMARKS ON HOUSE-DRAINS AND WATER-CLOSETS.—As in a complete system of water supply every house should have a water-tap provided, so each house and yard should have a drain to take off the refuse. A branch to the sink may be provided, with a bent syphon or water-trap: into this branch, in many instances, the water from the roof will pass direct, and there should be a separate branch for the surface drainage and water-closet. Detailed estimates have been made out for such apparatus in other places, and the works executed for a cost to each house not exceeding an annual charge of 3s. 9d., or less than 1d. a-week.

Effective tile-drains may be laid down at a cost much below the usual charge; drain-tiles, 12 inches by 9 inches, have been laid

complete for 3*s.* 6*d.* each lineal yard; and house-drains, 6 inches and 4 inches diameter, have been laid down complete, including traps, at an average of 1*s.* 6*d.* each lineal yard. These prices include tiles, excavation, laying, and making the ground good.

The following extract is from a letter on the drainage of Back King-street, Bury, by *William Harper, Esq.*, solicitor, and one of the Bury Improvement Commissioners:—

“ I am happy to say that the plan of draining Back King-street, as laid out by you, has fully answered our expectations. It has been carefully executed by our workmen, under the superintendence of our surveyor, Mr. Johnson. The work has been done for a less sum than your original estimate.

“ The main drain is 12 inches by 9 inches, egg-shaped, and is laid at an average depth of 9 feet: this cost complete, about 3*s.* 6*d.* each lineal yard. The cost of gulleys and traps is about 1*l.* sterling each. The cost of yard and house-drains (some of which are 6 inches diameter, and others 4 inches diameter) was 1*s.* 6*d.* each lineal yard, laid complete. The average cost to each house for the yard, house, and branch-drains, was about 10*s.*; but some of the cottages did not cost more than 5*s.* 1*d.* each.

“ Back King-street was by far the filthiest in the town, and the rate of mortality exceeded the general average. Dr. Lyon Playfair states, at page 87 of his report,—‘ According to the evidence of Mr. Fletcher, its unventilated courts, unsewered street, and filthy surface, rendered it exceedingly unhealthy, as shown by the astonishing proportion (62 per cent.) of infantine mortality, and the low average of life, amounting to 14 years only, and also in the frequency and severity of epidemics among its population.’

“ This street is now thoroughly drained and paved; every house is drained, and syphon traps have been placed on all the sink-pipe drains. The down-spouts from the roofs are carried directly into the drains below the syphon trap, and thus the rain-water from the roof flushes the drain, and the down-spout ventilates it. Mr. Johnson, the surveyor, states that, ‘ since the completion of these works, the houses let much better than formerly; and several parties who had given notice to quit, in consequence of the bad sanitary condition of the street, have renewed their tenancies.’ The Superintendent Registrar states, that ‘ the health of the district has been materially improved; and that, though several cases of cholera have taken place in Bury, not one has occurred in Back King-street; in its former state this would most probably have been the first place where such disease would have shown itself.’

(Signed)

“ WILLIAM HARPER.”

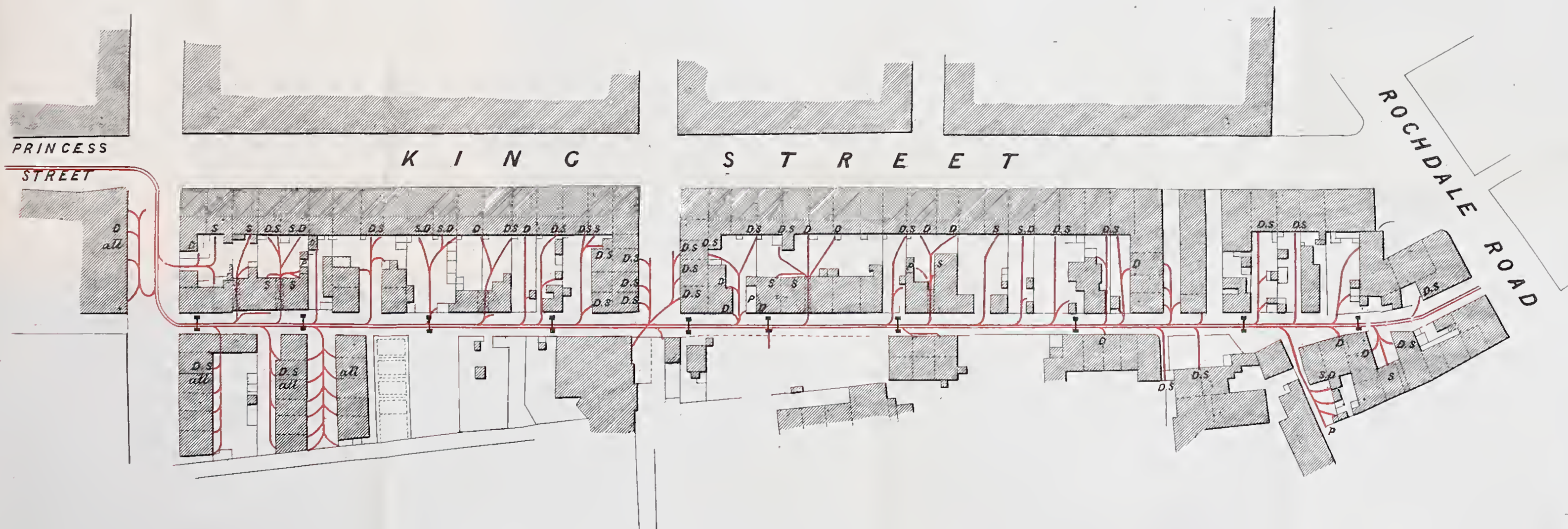
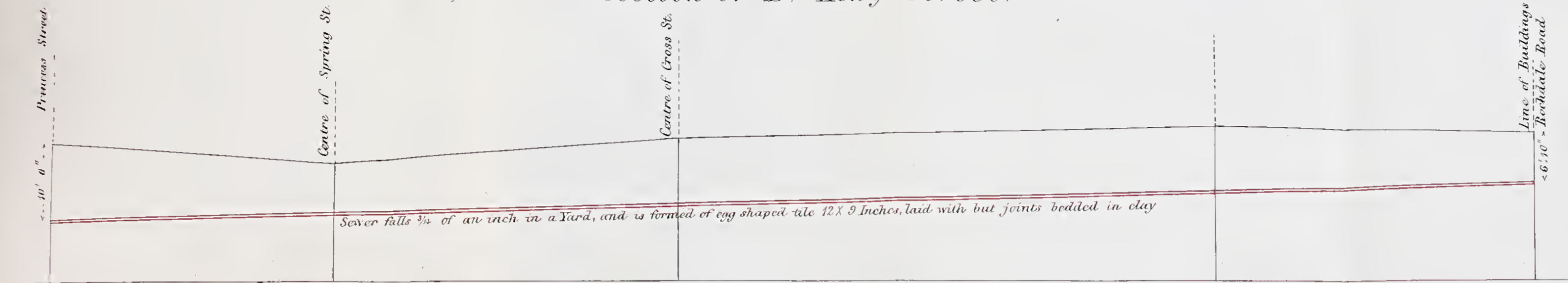
The accompanying plan shows the system of back drainage as laid down in Bury.

LAND DRAINAGE.—It is not my intention to enter at length into this question, as the limits of this Report will not allow of the necessary details. The results of thorough drainage are well known. The subsoil and surface soil of the district varies from stiff clay to a light sandy loam; there is also some moss; marl fit for manure may be obtained from the stratification. In common

ALTRINCHAM REPORT.

PLAN OF PART OF BURY, LANCASHIRE.

Section of B^k King Street.



Enlarged Plan of Street



Double Red Line, Main Sewer 12 X 9 Tile.
 Single D^o House Drains.
 D.S signifies Down Speats & Slep Water from houses.
 S. Slep Water, & P. Privies.
 Black Dots in Street show drains & Bell Trap Grates.

Actual Cost of drains including labour & materials.
 Main Drain 12 X 9 Inches 3^s 6^d per lineal Yard complete
 Cross Drains 4 Inches diameter 1^s 6^d per D^o D^o
 House Drains 4 D^o D^o 1^s 6^d per D^o D^o

with the whole western side of the island the atmosphere is moist ; the clouds and vapour from the Atlantic Ocean are drifted in by the prevailing winds, and these are intercepted by the line of hills dividing Lancashire and Yorkshire ; hence the excessive quantity of rain which falls as compared with the eastern side of the country. The wetness of the climate is unfavourable to the ripening of corn, but is in some measure serviceable to pasturage ; the prevailing moisture, however, reduces the general temperature, and is consequently alike injurious to animal as to vegetable life. Effective draining would free the land from excessive wet, and would thereby prevent evaporation, which at present materially reduces the temperature and produces fog.

Much of the land in the district is at present occupied by detached houses, villas, &c., and here perfect drainage is of the first importance ; and it will be found that to attain this the powers of the Act should be as extensive as the boundaries of the chapelry or township for the purpose of obtaining proper outlets. The rating clauses of the Act have been drawn up with reference to cases of this description. Land will pay on one-fourth its annual value to the establishment charges alone ; and for this the powers of the Act may be used by any land-owner when he wishes to avail himself of them. The local Board will become surveyors of highways, and in draining and improving these, outlets for the adjoining land may be given at a light cost. The road drains may, in many instances, be made to answer for outlet land drains also. In roads and footpaths the drainage cannot be downward by percolation, but over the surface to the sides ; and here covered drains ought to be constructed with gully-shoots properly trapped to prevent the ingress of sand or silt. Circular tile-pipes will be found the best for drains of all sizes from two feet diameter downwards, to 2 or $1\frac{1}{2}$ inches for land drains. For house drains 4 inches will be the least size used. Drain tiles for land, 15 inches long, 2 inches diameter, and set with loose collars at the joints, have been extensively used in the north ; and, as I was informed, with advantages over any other form of drain-tile. They are more readily laid than tiles with soles, and the collar prevents the joints from being removed improperly apart in filling the trenches. Tiles of this description may be furnished on the site to be drained for 25s. per thousand ; and to trench them in, 3 feet 6 inches or 4 feet in depth, will cost, including all labour and material, from 4*l.* to 6*l.* per statute acre, according to the width of the drains apart. Many cases have occurred where heath or moorland, dear at a rent of 5s. per acre, has, when thorough-drained and subsoiled, become worth 30s. or 2*l.* ; and of clay land, dear at 7s. 6*d.* per acre, becoming worth 3*l.*, or in localities near a town even 4*l.* or 5*l.*

Thorough-drainage and subsoiling improves the quantity of the crops, as well as increases the productiveness of the land ; all manures act with more energy ; the land stands wet and drought

better than undrained fields of the same natural character of soil; drained land is more easily tilled, and may be worked through a greater space of time in each year.

Much of the land in the district is under culture as market gardens, on an area of 16 square miles; it was given in evidence, that eight tons of onion seeds are annually sown; early potatoes and other vegetables are also grown to a considerable extent. Manure in the solid form is carted from Manchester, to be laid on as a top dressing; the quantity used amounts to many thousands of tons per annum. The farmers take produce into Manchester and cart manure back, a large amount is also brought out in boats by the Bridgewater Canal. Manure in this form is most expensive, and to some extent injurious to the land, as solid rubbish of all sorts, such as sticks, stones, broken pots, glass bottles, &c., are mixed with the ashes and soil. The taint or smell from this sort of dressing also remains for days or weeks, and consequently is peculiarly objectionable near houses; whereas, if land has been drained and liquid manure is properly applied, all trace of smell passes off in one hour. The productive effect of the manure is also much greater in the liquid than the solid form. A proper system of town drainage will preserve the liquid and soluble portions of the refuse entirely free from ashes and other solids, which may be removed separately.

OBSERVATIONS ON TILES, TILE-MAKING, AND THEIR USE FOR LAND AND TOWN DRAINS.—Earthenware tiles have recently been brought into extensive use for land drainage, for street and house drains, and even for the main outlet sewers of towns. Through the indefatigable labours of Edwin Chadwick, Esq., and others, this subject has been thoroughly investigated, theoretically and practically; and the result of both experiment and practice is, that pipes of comparatively smaller diameter serve better the purposes of drainage than the large and much more expensive brick and stone sewers and drains hitherto used. The power of water to remove solids and semi-solids is in proportion to the volume, head, or vertical depth, and the gradient down which it is made to flow. Thus, all these things being the same, a pipe of 4 inches diameter will drain any ascertained area within its capacity better than a larger sewer; as the power of water to remove solids and semi-solids sent in from house and yard drainage will be greater the more nearly this pipe is graduated to the volume of water to be sent through it. There are other considerations with respect to house drains which dictate a minimum diameter of pipe, rather than the volume of water to be passed from any one house: as, for instance, the drain from any one water-closet should, until the pipes are more evenly made, be not less than 4 inches internal diameter. But one such 4 inch pipe may have several 4-inch branches, and will remove or take off the drainage of several houses. Experiments and actual experience have proved

that such a pipe will be preserved in work, open and clean from refuse sediment; whilst all past experience has proved that the more expensive house drains of 2 feet, 18 inches, and even those of 12 and 9 inches diameter, inevitably choke with sediment and refuse, and ultimately become blocked entirely up; because the volume of water is spread out over a wider area in drains of these larger dimensions, and the whole solid refuse is deposited in the drain, and much of the thin and stagnant sheet of water soaks away. Should there be the slightest imperfection in the traps or junctions of large drains, the foul and most unwholesome gas which is generated is gradually but constantly passed into the houses, alike destructive of health and comfort, and tending to produce premature death.

The discharges of water through pipes of small diameter, and laid at varying angles of fall, have been recently tested, and it has been found by experiment that a pipe of 6 inches internal diameter, laid at an inclination of 1 in 60, and the head just filled, will discharge 75 cubic feet of water per minute; and in the length of 100 feet the sectional area of the pipe occupied is reduced to below one-half. The whole volume of water such a pipe will pass through it in 24 hours is equal to 675,000 gallons, or more than an average depth of rainfall, over an area of upwards of 14 acres, supposing the whole water leave the ground in that time. But little more than one half the rainfall is found to flow off the land, much of it being absorbed or evaporated. This volume of water will pass through a single line of pipe without branch feeders; but by a proper junction of branch pipes a much larger volume will be delivered through the main pipe, as the velocity is increased with the volume up to a certain point.

House and town drains have but one principal purpose to serve, namely, the perfect and speedy removal of all liquid, soluble and semi-solid refuse, to some common outlet or reservoir, where it may be dealt with for agricultural purposes, without creating a nuisance or in any way endangering health. Land drains have an important purpose to serve; and that the drains may perform this operation perfectly, the main outfalls should be well chosen, their inclination, or gradients, the best the district will afford; the form and capacity of the drains such that they will not only pass off the water, but remove all sand and silt which may find its way into them; and the outfalls and branch drains should be so laid that no permanent lodgment of water can ever take place in any portion of their length. To thoroughly drain a county is to raise its temperature from 6 to 10 degrees, to increase the fertility of the land, and, in a climate notoriously fickle, to insure an early harvest—it is, in fact, tantamount to removing the whole county so many degrees south.

NATURAL STREAMS OR WATER-COURSES NOT TO BE TURNED INTO SEWERS.—It is stated in the Metropolitan Water Report,

that, "One common mistake, leading to excessive expense and inefficient work, in laying out the drainage of a town is, to arch over some natural stream or water-course as a main or outlet sewer, and this frequently costs as many pounds per yard lineal as a pipe-sewer necessary for the drainage of the houses would cost shillings. It is a mistake in any instance to form a natural water-course into a main sewer, for the following reasons:—1st. The area drained by a brook or other natural water-course will, in general, be many times greater than the area occupied by buildings; the flow of water will be irregular and uncertain; being the least when most required, and being in excess when it is a nuisance rather than a benefit. 2ndly. The dimensions of the sewer must be capable of taking away the heaviest rainfall of the whole district, and, consequently, must be of dimensions much beyond the requirements of the town proper; the expense will be in proportion to the dimensions. 3rdly. The sewer must be open at both ends, on account of sudden floods; sticks, stones, sand, and other similar material will be washed in from the open country, to be deposited within the sewer in dry weather. This rubbish will retard and retain the refuse from the house-drains passed into it; and in all dry seasons such a main sewer will become most foul and dangerous to health, probably requiring hand labour at a great cost to cleanse it. The natural water-courses of any district should, as much as possible, be restored to their original purity by cutting off all house-drainage; it is cheaper to construct sewers and drains entirely independent of all such means of outlet: 1st. Because the sewers and drains can be accurately graduated to the work they have to perform at all seasons and under all circumstances; 2ndly. Because the refuse may best be collected, direct, and dealt with for agricultural purposes; and 3rdly, where it may be advantageous to pump the whole refuse, that which properly belongs to the town and the houses drained is alone lifted; and where it becomes necessary to arch over a natural water-course through a town, such a tunnel ought not to be contaminated with sewage refuse."

The great evil resulting from having made artificial and natural streams the recipients of a town's refuse is witnessed and felt to a painful extent in the suburbs of Manchester, and for many miles along the course of the river and canal. Extended sanitary operations in Manchester add to the existing mischief: the multiplication of street and house-drains only pour down a larger volume of refuse to act with tenfold virulence in rivers which ought to perform the beneficial duty of purifiers. The filthy condition of the Irk, the Irwell, the Cornbrook, and the canal, is most disgusting in dry weather; the entire volume of these streams is one mass of fermenting corruption for 15 or 20 miles down their course. The water above and in Manchester is used by bleachers, printers, and dyers, the refuse from which works is passed into the streams.

In Manchester, the water thus tainted is further used for condensing and other purposes in steam engines, and is discharged heated, back into the open or covered water-courses, which also receive the drainage of this large town; so that a semi-liquid compound is formed, an accurate idea of which no written description can convey. A thick scum coats the surface, upon and over which birds walk; the putrid carcasses of dead animals, dogs, cats, &c., float and rot in the midst; fermentation takes place rapidly, as large bubbles of gas may be seen escaping, and a thick vapour constantly hangs over the entire area. An excessive flood from rain slightly diminishes the evil, but a few dry days renew the mischief. Sooner or later the whole of this refuse must be cut off by intercepting drains from the rivers, or the nuisance will be increased to an extent which must render the land in the vicinity uninhabitable. This ought to have been the first consideration in an improved system of drainage. Intercepting drains should be the first work undertaken, and not be left until the last. When a full water-supply is carried out, and water closets have become general; some terrible loss by disease may certainly be anticipated; should the present condition of things be continued.

REMARKS ON STREET PAVEMENTS, ROAD FORMATION, AND STREET AND ROAD CLEANSING.—More experiments have probably been tried in street-making throughout this county than in any other branch of engineering, and a truly good street pavement is a problem yet to be solved; and if we examine all that is required, and what has been done, the reason of failure will be self-evident. A good street pavement should have the quality of a smooth and even surface, that wheeled vehicles may pass over it without jolting; it should be capable of resisting wear, to avoid the inconvenience and expense attendant upon frequent repairs; and it should offer sufficient footing to horses, that they may pass over it with perfect safety at the usual velocity. Freedom from dust and mud is only to be attained on any road or pavement by due and well-regulated cleansing.

Granite, limestone, or other stone pavement, chosen for its hardness, is found invariably to become slippery from wear, if laid down in large blocks, and consequently that which recommends it for durability is fatal to its safety; and to partially remedy this defect, one of the first essentials to a perfect pavement is set aside; namely, smoothness; the stones are procured narrow, and are set apart, to give foothold to horses; and thus, to avoid one defect, three others are substituted. Each stone rests on a narrow base, and is, in a degree, isolated or separated by a wide joint, leaving it, in a measure, independent. The open joint admits wet and harbours dirt, and the space betwixt each stone causes the wheels to strike the pavement, instead of passing smoothly over it. This action is destructive alike to pavement and vehicles, as every wheel acts the part of a pavior's rammer; to this is added the constant jarring

noise, so disagreeable to passengers and tradespeople. Wood pavement is not so noisy, but offers all the objections of insecurity in an aggravated degree. Pebble pavement has generally been banished from all streets over which there is much traffic, and its use ought to be entirely abolished, as the form of the stones is the worst possible for comfort and wear.

Macadamized roads for towns have been tried on a large scale in Birmingham; in fact, all the streets in that town and the roads surrounding it are of this description of material, and with constant care and attention they are found to possess many advantages; when in perfect order they offer a comparatively smooth and even surface for the wheels of carriages, and when well watered and cleansed, they also afford a secure footing to horses; the carriage passenger experiences less of jarring, and the shopkeeper and pedestrian less of noise. To produce and maintain a good street surface of broken stone, several things are necessary: the material should be hard, to resist wear; it should be broken to an uniform size, that the wear may be equal, and means should be taken to form it into an even surface before the stones are separately rounded by the traffic; and the street or road should have a well-drained and solid foundation on which to place the broken material. When such a road has been formed, it requires constant attention and care to preserve it in perfect order; it must be regularly watered and swept in dry weather, and well cleansed by sweeping with the machine in wet weather.

Neglected, imperfect, and bad roads and streets are the most expensive. They are disagreeably dusty in dry weather, and they are destructive alike of health and comfort in wet weather; a rough and uneven road rapidly destroys the wheeled vehicles which pass over it, and their violent action when in motion tends, in an aggravated degree, to the further destruction of the road; ruts and holes retain the wet; this softens a place already weak, and accumulates mud; and on such roads horse power is wasted, at times, to the extent of one-half, or 50 per cent. "It is a common error to consider that road or street the cheapest which costs the least in direct expenditure;" and it is just as common an error to consider that road or street the best which has cost the most in its first formation. Perfect cleansing and constant attention and care are requisite on all roads.

The best form of pavement I have seen is composed of small granite cubes, about three inches square, well squared, and set close on a properly prepared and drained foundation. The numerous joints afford foot-hold to horses, and, being well squared and set close, the surface is even for wheeled vehicles.

WATER SUPPLY, REMARKS ON.—A full supply of pure water will be a great advantage to the inhabitants; local wells and pumps ought to be abandoned for several reasons:—

1. The water from the new red sandstone is rarely below 16

degrees of hardness, and is frequently much more, as see Dr. Clark's analysis of the wells in Altrincham. A good water ought not to exceed four degrees of hardness.

2. Water obtained from wells and pumps sunk in a town or near dwellings and grave-yards is known to become tainted by infiltration.

3. It is necessarily expensive and inconvenient to obtain water from wells and pumps, as the following remarks, extracted from the Metropolitan Water Report, will show:—

“ It is commonly considered that a sufficient and even liberal arrangement is made for the poorer classes if supplies of water be brought within their reach in public fountains or in stand-pipes, placed in their streets and courts, at which they are allowed to help themselves gratis. The notion, however, that such supplies can be gratis is wholly erroneous. As compared with what may be accomplished by a supply of water under natural or artificial pressure, they are highly expensive, and to the poorest classes, who can least afford waste of that which is their only property, namely, their labour, the arrangements in question are the most oppressively costly,—so costly as to act as prohibitions of the full and free use of such a quantity of the natural element as is requisite for health and comfort.

“ To illustrate this, we might take the case of a family, living at one end of a court or street, having to fetch their water from a stand-pipe, well, or pump, at the other end of the court or street, and actually consuming 50 gallons per diem.

“ This would be upwards of 20 pails' full per diem, or 140 pails per week, to be fetched from the stand-pipe or pump. The weight of water alone to be carried per diem would be 500 lbs., or, per week, 3,500 lbs.; add one-fourth to this, as the weight of the pitcher or pail, and the actual weight carried is 4,375 lbs. To fetch the water, and carry such a weight, would probably require the amount of two days' labour in the week.

“ In towns it generally occurs that for persons capable of performing such labour there is other labour to be performed, yielding wages however low. Suppose the labour to be performed by the labourer's wife, and that she could otherwise gain only 6*d.* per diem, the expense of fetching and carrying will be 1*s.*

“ But few of the tenements occupied by the labouring classes, or indeed of the upper rooms of houses occupied by the higher or middle class, have any waste or 'return pipes,' and the whole of this waste water would have to be carried down again, which would double the amount of labour.

“ The consequence of this excess of labour is, that though the water may be brought to the very door, or into the yard, there to be distributed gratis, the labour, *i. e.*, the expense, acts as a restriction on the use of the commodity to the smallest quantity that can suffice. The female may be seen with a child in one arm, which she cannot leave alone, painfully carrying up-stairs a pail or a large jug of water. This, in consequence of the severity, or extreme inconvenience of the labour, she makes suffice for the day. At night the husband comes home, tired from his work, and dispenses with the means of an even-

ing's, and even a morning's ablution, rather than be at the trouble of fetching the water; and bad weather, rain, or snow, frequently second the disinclination. Instead of the labour of the poor spent in these and the like exertions costing them nothing, and being the easiest spared, as the common theory of the provision by gratis fountains and stand-pipes assumes, their labour, not only in consideration of the exhaustion by other and more profitable work; but of the casualties from sickness, helplessness, and decrepitude, requires to be most carefully economised by arrangements on a larger scale. When it is known that (in the absence of cheaper means of elevation by natural pressure) 30,000 or 40,000 pails' full of water may be lifted upwards of 50 feet high for 1s. by the application of steam power, it will be perceived that it amounts to pecuniary waste on the largest scale to continue to impose such an amount of labour on 30,000 or 40,000 females, apart from any consideration of the cruel inconveniences which such a labour must impose.

“Public men, and even engineers, regard large aqueducts with copious and visible discharges of water by fountains as conclusive evidence of the fulness and completeness of supplies of water. But the finest river may be at the very doors of a large proportion of the population of a city—as is the case, indeed, with the Thames and its tributaries—and yet the supplies to the inhabitants, and especially to the residents of upper tenements, may, from the want of proper distributory apparatus, be as restricted as if such river were at a distance. In all continental cities, where the supply to upper rooms is by hand labour, the actual consumption is extremely small. We believe that in Paris the domestic consumption does not exceed two gallons per head on the population, even in well-conditioned districts.

“The waste of labour in lifting water supplies from a well by the machinery of a common pump is similar to that above described. The expense of sinking and forming the well, of the pump itself, machinery, interest, care and repairs, usually is about four times the rate of contribution requisite for the large distributory apparatus, which is moved by an immense steam-engine of several hundred horse power, one of the highest combinations of science and art.

“The system of gratuitous distribution, by intermittent, or even by constant supplies at stand-pipes or fountains, is open to the further objection, that whilst from the labour it imposes it is expensive to the parties intended to be benefited, it subjects the rest of the inhabitants to additional expense in erecting and maintaining these places of supply.

“That the convenient distribution of water governs the habits of households of the higher and middle classes is shown by the fact, that when the delivery of the water is interrupted by any defect in the distributory apparatus, or by frost, and additional labour is interposed in the way of obtaining water, the house cleansings and washings are diminished in frequency, and every presumption is afforded that if it were at all times and in all weathers requisite to send to a distance for water, the habits of household, and even personal cleanliness in such dwellings, would be deteriorated. The extension of conveniences for cleanliness and decency must precede the establishment of cleanly and decent habits among the labouring population.”

I have not had the time necessary to devise any scheme of water supply, or to examine the natural capabilities of the dis-

trict; but should the local Board not be able to treat with the Manchester Corporation for a branch from their works, I have little doubt as to a local supply being obtained: if not from Ros-thern Mere, as proposed at the inquiry, (the water of which, according to Dr. Clark's analysis, is favourable,) yet from impounding reservoirs. But this question I must leave for the consideration of the local Board should the Act be applied.

PUBLIC WALKS AND RECREATION GROUNDS.—There are no public walks or recreation grounds, but it will be seen by the Appendix, that certain land is at present in the possession of the freeholders or charterers; whether this can be appropriated to such a use, or may in any other form be rendered beneficially useful for the general public, will remain with the local authority.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

I. That the sanitary condition of the chapelry of Altrincham is exceedingly defective.

II. That the geographical position and physical contour of the town are naturally very favourable to health.

III. That the occupations of the inhabitants are such as, under proper sanitary arrangements, would probably secure to them the highest degree of longevity attainable in this country.

IV. That the expedients for obtaining water for domestic purposes are exceedingly defective and very costly.

V. That there is no effective town drainage; that the cess-pools, privies, and appurtenances to houses are such as to be injurious to the health of the people; and that there are no proper arrangements for the removal of decomposing animal and vegetable matters from the midst of the population.

VI. That great advantage would accrue by forming public walks and erecting baths for the accommodation of the inhabitants.

VII. That the health of the inhabitants would be further improved by

a. An abundant supply of good water, with a tap in every house.

b. An efficient system of drainage of the site of the town, and of all buildings, including the abolition of all privies as at present constructed, and the substitution of water-closet or soil-pan apparatus.

c. Improved pavement, and surface cleansing.

d. The better drainage of the agricultural land.

VIII. That such of the above improvements as are of the nature of public works may, in all probability, be accomplished at the following rates per week for a cottage house:—

a. Constant supply of water, with a tap in the house, at *one penny*.

b. Efficient drainage of house, court, privy, &c., at *one penny*.

c. Improved pavement of public footways, at the same price as the present pebble pavements.

d. Efficient cleansing of the surface of streets and courts, at *one halfpenny*.

IX. That, irrespective of the additional comfort, and the improvement to the public health, the whole of these charges would probably be less than the existing direct and indirect cost.

X. That the whole of the sewage of the town may be applied to the garden and meadow-land with much advantage to such land.

XI. That it would be highly advantageous if the local Board could purchase the gas-works, that the public lighting may be in the power of the rate-payers.

WHEREUPON I BEG RESPECTFULLY TO RECOMMEND:—

1. That the Public Health Act (1848), except the section numbered 50 in the copies of that Act printed by Her Majesty's printers, should be applied to the town and chapelry of Altrincham, in the county of Chester.

2. That the local Board of Health, to be elected under the said Public Health Act, shall consist of nine persons, and that the entire number shall be elected for the whole of the said district.

3. That one-third in number of the said local Board shall go out of office on the 25th day of March in each year subsequently to that in which the said first election takes place.

4. That every person, at the time of his election as member of the said local Board, and so long as he shall continue in office by virtue of such election, shall be resident, as in the said Public Health Act (1848) is required, and be seised and possessed of real or personal estate, or both, to the value or amount of not less than one thousand pounds; or shall be so resident, and rated to the relief of the poor in the said parish upon an annual value of not less than twenty-five pounds.

I have the honor to be,

My Lords and Gentlemen,

Your very obedient servant,

ROBERT RAWLINSON,

Superintending Inspector.

The General Board of Health,

§c. §c. §c.

APPENDIX.

IN embodying the following remarks, which were furnished as evidence at the inquiry, I fully concur in the recommendations relative to the mayor's property. At the inquiry the subject was named by Mr. Joynson and others; they thought if the land could be laid out for building purposes as suggested, a much larger rental would be obtained, and if this could be used for public purposes, much good might result to the inhabitants and rate-payers generally. A park or recreation ground might be obtained and set apart for public use. Public baths might be erected and maintained; a public library might also be established; and a school or schools be endowed or assisted. This however will be entirely in the hands of the local Board. Mr. Joynson stated, "they had reason to believe that Lord Stamford, whose ancestors left the property in question to the mayor and burgesses, would have no objection to its being made available for the improvement of the town." Mr. Turton said, "the income from the land was at present of no use whatever, for it was spent in eating and drinking." Mr. Bennett then referred to the poor's land, which, he stated, "was vested in trustees for the benefit of the poor expressly." The meeting was strongly of opinion, that if this land was laid out for building purposes, its value would be greatly increased. Mr. Turton stated, "that there were nine acres of the poor's land, and thirtecn acres of the mayor's land."

In advocating any alteration in the management of this land, or any different application of the funds to be obtained from it, it is considered that, if vested in a local Board elected by the rate-payers as the Public Health Act directs, the income will be secured for public and beneficial purposes. I cannot help remarking, however, that charitable endowments and corporate estates have not necessarily a beneficial influence; numerous instances might be adduced where the consequences are the reverse; charity may demoralize, and an endowment may corrupt; if the one is thoughtlessly applied and the other is viciously administered, these are the inevitable results. The affairs of Manchester are much better and more beneficially managed, where there is no corporate estate, than those of cities and boroughs having large annual incomes, which are spent in civic pride, pomp, and feasting.

REMARKS ON THE IMPROVEMENT OF ALTRINCHAM, *which had been drawn up and printed for local use and information.*

"This neat and clean little town is now suffering (as Manchester did for at least a century), from having outgrown the feudal usages and regulations under which it has hitherto been governed. In the reign of Edward I. (about the year 1290), Sir Hamon de Massy, baron of Dunham Massy, granted a charter to Altrincham, making it a free borough; and granting to the burgesses 'a Gild Mercatory [a society or corporation for free traffic in merchandise] in the same burgh, with all the liberties of free customs belonging to such a gild, according to the customs of the burgh of Macclesfield.' The lord exempts his burgesses of Altrincham, throughout the whole of his land, from all toll, bridge or

passage money, stallage, lastage, and other servile customs. He also grants them common pasturage, hay turf, pannage, &c. ; requires them to grind all their corn at his mill, 'for the eighteenth vessel full, of [as] the *multure* or miller's toll.' Then follows this clause :—

· “ And I also grant that *my said burgesses may make to themselves Provosts or Mayors [præpositos] and bailiffs, by the common advice of myself and of my bailiffs and theirs*, and that no plea in the said burgh be held or determined, except before me or my bailiffs.”

“ The remainder of the charter fixes the terms on which burgages are to be held of the lord ; reserves to him and his heirs, ‘the privilege of our oven in the said burgh ;’ and undertakes to maintain the rights thus granted to the burgesses, ‘against all people for ever.’ By a charter in the 18th year of his reign, Edward I. grants to Hamon de Massy a market on Tuesday at his manor of Altrincham, and a fair of three days’ duration, on the eve, the day, and the morrow of the Feast of the Assumption of the Blessed Mary (August 15th). Now, the passage given in italics in the above clause is that with which we have at present to do. Under it, a mayor has been annually appointed at the Michaelmas court leet of the lord of the barony ; and though this municipal officer, who has no magisterial jurisdiction, has very few duties (chiefly to proclaim or open the fairs), and very little real influence in the town, he has certain privileges or perquisites, to which we must direct attention.”

“ It seems that at some remote period, the then lord of the barony and the town or borough of Altrincham, offered to grant to the mayor thereof a yearly payment of 5*l.*, or land of that yearly value, at his option. The mayor, like a wise man, chose land, which now produces a yearly rental of 80*l.*, or thereabouts. A similar offer being made at the same time to the mayor of Ashton-under-Lyne, he chose to have the cash, and consequently all he now receives is 5*l.* yearly. ‘The mayor’s land,’ as it is called at Altrincham, consists of three or four fields, distant from each other, one being on the Ashley Road, another on Hale Moss, near the gas works, and another near Oldfield Hall. Altogether, they amount to 13 acres 1 rood 26 poles statute measure, and the gross rental is about 80*l.* which the mayor has the sole right to receive, and to disburse at his discretion. Some are of opinion that the land is somewhat over-rented, when the depreciation in the price of agricultural produce is taken into consideration. Some portion of it is let as high as 16*l.* the large Cheshire acre ; and the whole averages about 6*l.* the statute acre. In one case, the bondsman or surety for a tenant, has had to pay 10*l.* for him of rent due, which the tenant was unable to pay. But the main thing is that the mayor does receive something like 80*l.* yearly, over the disbursement of which he has the sole control ; and the mayor being elected by the burgesses who choose to attend the lord’s Michaelmas leet, as jurors, it has too often been made the main qualification that the mayor-elect should be disposed to disburse largely of this fund, in the shape of good dinners and drinking-bouts to such portion of the burgesses as take delight therein. The total number of burgesses is small, probably not more than 40 or 50—(in 1402 there were about 40 freeholders, or charterers as they were styled ; in 1669, above 20 in the borough : the rest were tenants-at-will),—of whom some, not approving of this mode of expending the

money, do not usually attend the court leet or its dinners. We understand that the mode of 'transacting the business of the leet' is curious so far as the jury are concerned. They have no sooner assembled than, before the public business of the court begins, there is brought into the room, without command or direction from anybody, a slight refection of bread and cheese, &c., porter, and from half-a-dozen to a dozen of wine. This being disposed of, the jury are ready for deliberation. Then, after the business of the court on that day, or on some early one, there is a dinner, to which all the burgesses are entitled to come without cost to themselves, and several invitations are issued in a printed form. These two dinners, at the Easter and Michaelmas leets, cost about 30*l.* each, and in this way the greater part of the mayor's fund of 80*l.* is usually absorbed. We say usually, for we must guard ourselves against being supposed to assert or imply that the practice is invariable. There have been mayors who have thought the custom 'more honoured in the breach than the observance;' and amongst others, the late Mr. Gaskarth, who served the office two years, gave a considerable portion of the annual sum towards the erection of a house for the deputy-constable; and Mr. Bruckshaw, a subsequent mayor, paid the remaining portion of the debt incurred by this erection, upwards of 40*l.* Mr. Nathaniel Pass contributed upwards of 60*l.* from this fund towards the lighting and watching of the town, when it was done by voluntary contributions, before gas was introduced. Mr. Joseph Arstall, and other mayors, have applied a considerable portion of the fund to the purchase of blankets, &c., which they distributed to the poor; and the present mayor, Mr. James Hall, farmer, Bowdon, gave 10*l.* from this money towards the treat provided for the poor of the township, by a public subscription, on the occasion of celebrating the majority of the present Earl of Stamford. But these, we fear, are the exceptions to the rule; at all events, of late years a number of mayors have been elected whose well-known propensities appeared to be their chief recommendation to the choice of the jurors. In a pamphlet published last year by Mr. Thomas Shaw Peters, of Bollington, he says, 'the good people of the town, out of pure affection for, and joy at, 'their great officer,' have been charged with killing by their kindness more than one of the mayors of the borough of Altrincham.' He adds, 'the inhabitants of Altrincham (or those who are concerned) will, I am sure, yet learn to prohibit this more than foolish squandering of the mayor's funds.' On inquiry, we find that two deaths have actually resulted from this sort of expenditure of the money. One recent mayor was killed by falling down stairs, after a drinking bout of—'Success to his successor!'

"We do not wish to dwell on these painful things, as we know that they have long been regarded by the more respectable inhabitants as a sort of stigma on those connected with them, and various efforts have been made to get them altogether abolished, but hitherto without effect, although more than one town's meeting has expressed a strong disapprobation of such modes of expending a fund which, under judicious management and application, might be of considerable benefit to the town."

"We have gone at some length into the subject at this moment, because the annual election of mayor is at hand, and a judicious choice may do something to prevent the waste of the money during the ensuing

year. Lord Stamford's Michaelmas Court Leet for the borough of Altrincham is to be held on Wednesday next, and the burgesses will do well to attend, and elect as mayor some gentleman in whom they can have confidence that he will, to the utmost of his power, promote the real well-being of the town; in doing which, he will have the support of every right-minded burgess and inhabitant. If such a one should be elected, then it would be desirable that, as soon as possible, he would convene a meeting of the freeholders or burgesses to take the matter into consideration, and at all events to set the example of an application of the money to some public purpose, beneficial to the community, instead of being squandered in orgies which only serve to make the office of mayor itself worse than useless and ridiculous. We understand that the Earl of Stamford contributes 5*l.* to each or to both of the court-leet dinners. A small sum added to this, if necessary, would suffice; and the mayor, if the remainder were expended in the improvement of the town, need no longer have to look out and issue printed invitations to strangers and non-residents to join him at dinner. Not only would those respectable inhabitants who now keep aloof join in any such mark of respect to a mayor who was really doing some good, but they would of course pay for their dinners. At present all go scot-free: the mayor's fund and Lord Stamford pay the dinner bills."

"We may here mention another subject in which trust land is not producing by any means its real annual value, and which deserves public consideration. What is called 'The poor-house land' at Broadheath, near the north bank of the canal, consists of 9a. 3r. 28p. statute measure, and the old workhouse, now let as cottages, producing an aggregate rental of about 80*l.* The income derived from this property is applied in aid of the poor-rate. The trustees generally, we believe, distribute a portion of it amongst the poor, at Christmas, in coals; or in meeting any emergency on which the poor-law guardians cannot lawfully expend the poor-rate."

"Now, it has been suggested that an Act should be obtained for the purpose (amongst others) of authorizing the sale of these lands (the mayor's and the poor-house) upon chief rents, for building purposes; a measure which would probably increase the rental of each from 200*l.* to 300*l.* The same Act might authorize the application of the income from the mayor's land (after allowing something handsome, say 30*l.*, 40*l.*, or even 50*l.* for his worship, for the maintenance of due hospitality and other purposes) in improving the town. Its present scanty and imperfect sewerage is notorious, and is perhaps the greatest obstacle in the way of the sanitary committee accomplishing their object of an improved healthy condition of the town. Of course, the increased income derivable from the poor-house land, under the proposed arrangement, could only be applied to the relief of the poor."

If the Act is granted to the town, the local Board may probably be able to arrange for the beneficial improvement of the land, so as to secure the rights of all parties. The land was evidently granted originally to aid in the good government of the town, and to this purpose the income may now be most usefully applied.